



# **Air Quality Permitting Statement of Basis**

**May 11, 2007**

**Tier II Operating Permit and Permit to Construct  
No. T2-060510**

**RDO Processing, LLC, Dubois**

**Facility ID No. 033-00002**

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**PROPOSED for PUBLIC COMMENT**

## Table of Contents

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE .....	3
1. PURPOSE .....	4
2. FACILITY DESCRIPTION.....	4
3. FACILITY / AREA CLASSIFICATION .....	4
4. APPLICATION SCOPE .....	4
5. PERMIT ANALYSIS .....	5
6. PERMIT CONDITIONS.....	18
7. PUBLIC COMMENT .....	21
8. RECOMMENDATION .....	21
APPENDIX A - AIRS INFORMATION.....	22
APPENDIX B - EMISSIONS INVENTORY .....	24
APPENDIX C - MODELING REVIEW .....	28

## Acronyms, Units, and Chemical Nomenclature

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
CAM	compliance assurance monitoring
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission level
EPA	Environmental Protection Agency
gpm	gallons per minute
gr	grain (1 lb = 7,000 grains)
HAPs	Hazardous Air Pollutants
IDAPA	A numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometer
kPA	kilopascals
lb/hr	pound per hour
m	meter(s)
MACT	Maximum Available Control Technology
MMBtu	Million British thermal units
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NSPS	New Source Performance Standards
PM	Particulate Matter
PM <sub>10</sub>	Particulate Matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTE	Potential to Emit
RDO	RDO Processing, LLC
Rules	Rules for the Control of Air Pollution in Idaho
scf	standard cubic feet
SCL	significant contribution level
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SM	synthetic minor
SO <sub>2</sub>	sulfur dioxide
SO <sub>x</sub>	sulfur oxides
T/yr	Tons per year
µg/m <sup>3</sup>	micrograms per cubic meter
UTM	Universal Transverse Mercator
VOC	volatile organic compound

## **1. PURPOSE**

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01 Sections 201 and 404.04, Rules for the Control of Air Pollution in Idaho (Rules) for Tier II operating permits and Permits to Construct.

## **2. FACILITY DESCRIPTION**

RDO Processing, LLC (RDO) processes dehydrated potato products at the facility located near Dubois, Idaho. The process primarily involves potato dehydration to make potato flakes. Potatoes are cleaned, peeled, cooked and sized prior to being transferred into a drying unit. The main sources of emissions include boilers, dryers, dehydration lines, pneumatic material transfer equipment and packaging lines. Some dryers are of the direct-fired type and some use steam from the boilers.

## **3. FACILITY / AREA CLASSIFICATION**

RDO is a major facility as defined under IDAPA 58.01.01.008 for purposes of the Title V program because the actual or potential emissions of SO<sub>2</sub> and NO<sub>x</sub> exceed 100 tons per year. RDO is not a major facility as defined under IDAPA 58.01.01.205.01 (40 CFR 52.21(b)(1)) for purposes of the PSD/NSR program. The AIRS classification is "A."

The facility is located within AQCR 61 and UTM zone 12. The facility is located in Clark County which is designated as unclassifiable for all criteria pollutants (PM<sub>10</sub>, CO, NO<sub>x</sub>, SO<sub>2</sub>, lead, and ozone).

The AIRS information provided in Appendix A defines the classification for each regulated air pollutant at RDO's Dubois facility. This required information is entered into the EPA AIRS database.

## **4. APPLICATION SCOPE**

The purpose of this Tier II operating permit and permit to construct (PTC) is to:

- Permit the following changes for Boiler No. 1:
  - Increase the rated capacity from 99 MMBtu/hr (subject to NSPS Subpart Dc) to 150 MMBtu/hr (subject to NSPS Subpart Db). Reinstatement of permit T2-050511 conditions associated with NSPS Subpart Db (conditions 3.4 – 3.12, 3.14, 3.16, 3.17, 3.19, 3.20- 3.28, and 3.30 – 3.39, with changes as needed for a unit modified after February 25, 2005, which were replaced through Item No. 4 of Case No. E-060001 Consent Order (Consent Order), issued February 8, 2006 by applicable Subpart Dc conditions.
  - Increase the permitted daily maximum residual fuel oil consumption in this boiler from 17,748 gallons to 24,984 gallons,
  - Increase the permitted maximum annual residual fuel oil consumption from 5,176,536 gallons to 9,119,160 gallons, and
  - Include biodiesel as an approved fuel type for use in the boiler.
- Reflect the installation of a scrubber with a venturi on Boiler No. 1 to control SO<sub>2</sub> and PM/PM<sub>10</sub> emissions.
- Permit a third 30,000-gallon fuel oil storage tank.

- Incorporate the following conditions for Boiler No. 1 specified in the Consent Order:
  - Item (e). Replace the exclusive use of very low sulfur fuel oil (i.e., less than 0.3% by weight) with ASTM Grades 1 through 6 fuel oil that meet IDAPA rules for sulfur content (i.e., maximum residual fuel oil sulfur content of 1.75% by weight).
- Replace throughput limitations specified in the Consent Order for the Flaker Drum Dryers, National Dryer, and Fluidized Bed Dryer intended to keep PM<sub>10</sub> emissions below 100 tons per year (T/yr) with the modeled emission rates.

#### **4.1 Application Chronology**

May 5, 2006	Receipt of facility-wide Tier II operating permit and PTC application.
June 5, 2006	Application determined to be incomplete.
July 13, 2006	Receipt of response to incompleteness.
August 9, 2006	Application determined to be complete.
December 11, 2006	Draft permit and statement of basis sent to the Idaho Falls Regional Office (IFRO) for review and comment.
December 13, 2006	Response received from IFRO (no comments).
December 15, 2006	Facility draft permit and statement of basis issued to facility for review and comment.
January 12, 2006	Receipt of facility comments. DEQ determined that comments that constituted a change of scope (i.e., raising the Boiler No. 1 stack height from 45 feet to 101 feet, increasing the nickel content of the fuel oil, and rerunning the modeling for the higher nickel emissions) must be submitted as a separate PTC project.

## **5. PERMIT ANALYSIS**

This section of the Statement of Basis describes the regulatory requirements for this Tier II and PTC.

## 5.1 Equipment Listing

Table 5.1 lists all sources of regulated emissions in this permit.

Table 5.1 SUMMARY OF REGULATED SOURCES		
Emissions Unit(s) / Processes	Emissions Control Device	Emissions Point
<u>Fuel Oil Storage Tanks: Nos. 1, 2, and 3</u> Capacity: 30,000 gallons each Type: Vertical, fixed roof Size: Shell Height 26 ft, Diameter 14 ft Paint: White painted shell and dome roof	None	No Stacks
<u>Propane Heaters: Nos. 1, 2, and 3</u> Manufacturer: Maxon Model: SC Burner Type: Horizontally-fired, 100% space heating Rating: 1.2 MMBtu/hr Fuels: propane, natural gas	None	<u>REC 1</u> Stack Height: 35.38 feet <u>REC 2</u> Stack Height: 34.58 feet <u>REC 3</u> Stack Height: 35.58 feet  <u>REC 1, REC 2, and REC 3:</u> All stacks are vertical, with cap Stack Exit Diameter: 0.4 feet Exhaust Flow Rate: 0.025 acfm Exit Gas Temperature: 90°F
<u>Boiler No. 1</u> Manufacturer: Nebraska Boiler Manufacture Date: 1996, Modified: after Feb 28, 2005 Model: NS-F-89-ECON, Serial No. D-3465 Burner Type: Horizontally-fired, Low NO <sub>x</sub> burner Rating: 150 MMBtu/hr Heat Release Rate: 73,400 Btu/hr-ft <sup>3</sup> Fuels/Max Usage: ASTM Grades 1 - 6 fuel oil (max 1.75% S): 1,041 gal/hr, 9.12E6 gal/year Propane: 1,596 gal/hr, 1.4E07 gal/yr Natural Gas	<u>Lime Slurry Scrubber with venturi</u> Mfr: Innovative Scrbber Solutions, Inc. Efficiency: 92% for SO <sub>2</sub> Mfr Guarantee: 0.03 lb/MMBtu for PM <sub>10</sub>	<u>BOILER NO. 1 Stack:</u> Stack Height: 45 feet Stack Exit Diameter: 6.65 feet Exhaust Flow Rate: 43,453 acfm Exit Gas Temperature: 123°F
<u>Boiler No. 2</u> Manufacturer: Superior Boiler Works Model: 6-5-100-S150-GP Burner Type: Horizontally-fired Rating: 6.7 MMBtu/hr Fuels: Propane, natural gas Fuel Usage: max. 6,381 scf/hr, 55.9 MMscf/year	None	<u>BOILER NO. 2 Stack:</u> Stack Height: 41.42 feet Stack Exit Diameter: 1.66 feet Exhaust Flow Rate: 2,880 acfm Exit Gas Temperature: 355°F
<u>Fluidized Bed Dryer</u> Manufacturer: Maxon Model: Ovenpak 400, Size 415H Burner Type: Horizontally-fired Rating: 4.5 MMBtu/hr Fuels/Max Usage: Propane, natural gas  Feed Material: Potatoes Process Rated Capacity: 2,000 lb/hr	None	<u>FLD DRY Stack:</u> Stack Height: 39.42 feet Horizontal discharge Stack Diameter: 1.92 ft <sup>a</sup> Modeled: Stack Exit Diameter: 0.0033 feet Exhaust Flow Rate: 1.7E-06 acfm Exit Gas Temperature: 110°F

**Table 5.1 SUMMARY OF REGULATED SOURCES**

<b>Emissions Unit(s) / Processes</b>	<b>Emissions Control Device</b>	<b>Emissions Point</b>
<u>Multi-Stage Belt-type Dryer, Stage A (Stacks A1 and A2)</u> Manufacturer: National Dryer Model: Eclipse 200 AM Burner Type: Horizontally-fired Rating: 3.6 MMBtu/hr Fuels: propane, natural gas  Feed Material: Potatoes Process Rated Capacity: 1,500 lb/hr	None	<u>NAT A1 Stack:</u> Stack Height: 46 feet, no cap Vertical discharge Stack Diameter: 2.68 ft <sup>a</sup> Modeled: Stack Exit Diameter: 0.0033 feet Exhaust Flow Rate: 1.7E-06 acfm Exit Gas Temperature: 150°F  <u>NAT A2 Stack:</u> Stack Height: 46 feet, no cap Vertical discharge Modeled: Stack Exit Diameter: 0.0033 feet Exhaust Flow Rate: 1.7E-06 acfm Exit Gas Temperature: 176°F
<u>Multi-Stage Belt-type Dryer, Stage B</u> Manufacturer: National Dryer Model: Eclipse 160 AM Burner Type: Horizontally-fired Rating: 3.6 MMBtu/hr Fuels: propane, natural gas  Feed Material: Potatoes Process Rated Capacity: 1,500 lb/hr	None	<u>NAT B Stack:</u> Stack Height: 46 feet, no cap Vertical discharge Modeled: Stack Exit Diameter: 0.0033 feet Exhaust Flow Rate: 1.7E-06 acfm Exit Gas Temperature: 167°F
<u>Multi-Stage Belt-type Dryer, Stage C</u> Manufacturer: National Dryer Model: Eclipse 160 AM Burner Type: Horizontally-fired Rating: 3.6 MMBtu/hr Fuels: propane, natural gas  Feed Material: Potatoes Process Rated Capacity: 1,500 lb/hr	None	<u>NAT C Stack:</u> Stack Height: 46 feet, no cap Vertical discharge Modeled: Stack Exit Diameter: 0.0033 feet Exhaust Flow Rate: 1.7E-06 acfm Exit Gas Temperature: 148°F
<u>Flaker Drum Dryers, Nos. 1-12 (Dehydrators)</u> Manufacturer: Various Model: Various Feed Material: Potato Flakes Rated Capacity: 90,000 lb/hr	None	<u>DRUM1 through DRUM12 Stacks:</u> Stack Height: 45.58 feet, with cap Vertical discharge Stack Exit Diameter: 3.58 feet Modeled Flow Rate: 0.0033 ft/sec Exit Gas Temperature: 125°F
<u>Flake Packaging Bulk Line</u> Manufacturer: Various Model: Various Feed Material: Potato Flakes Rated Capacity: 12,000 lb/hr	<u>Primary: Cyclone:</u> Mfr: Idaho Steel Efficiency: 90%  <u>Secondary: Baghouse:</u> Mfr: Micropulsair Model: #25-S-8-30-C Efficiency: 99%	<u>FP BULK Stack:</u> Stack Height: 38.75 feet Stack Exit Diameter: 0.33 feet Exhaust Flow Rate: 1,675 acfm Exit Gas Temperature: 68°F (ambient)
<u>Flake Packaging Line</u> Manufacturer: Various Model: Various Feed Material: Potato Flakes Rated Capacity: 8,000 lb/hr	<u>Primary: Cyclone:</u> Mfr: Idaho Steel Efficiency: 90%  <u>Secondary: Baghouse:</u> Mfr: Micropulsair Model: #12-8-160C Efficiency: 99%	<u>FP Stack:</u> Stack Height: 39.59 feet Stack Exit Diameter: 4 feet Exhaust Flow Rate: 14,024 acfm Exit Gas Temperature: 68°F (ambient)

Table 5.1 SUMMARY OF REGULATED SOURCES		
Emissions Unit(s) / Processes	Emissions Control Device	Emissions Point
<u>Flake Packaging Torit Line</u> Manufacturer: Various Model: Various Feed Material: Potato Flakes Rated Capacity: 8,000 lb/hr	<u>Baghouse:</u> Mfr: Torit Model: TD-162 Efficiency: 99%	<u>FP TOR Stack:</u> Stack Height: 33.92 feet, with cap Vertical discharge Stack Exit Diameter: 0.25 feet Modeled Flow Rate: 9.7E-03 acfm Exit Gas Temperature: 68°F (ambient)
<u>Flake Packaging Drum</u>	<u>Flake Packaging Drum Negative Air Baghouse</u> Process Feed Material: Potato Flakes Rated Capacity: 18,000 lb/hr Process Equipment or Air Pollution Control Equipment: Process equipment (product recovery)  <u>Primary: Cyclone:</u> Mfr: Idaho Steel Efficiency: 90%  <u>Secondary: Baghouse:</u> Mfr: Nol-Tech Systems Model: 238 Efficiency: 99%	<u>FP BH Stack:</u> Stack Height: 37.42 feet Stack Exit Diameter: 1.53 feet Exhaust Flow Rate: 12,000 acfm Exit Gas Temperature: 68°F (ambient)
<u>Tote Dump Station</u>	<u>Tote Dump Station Cyclone</u> Manufacturer: Custom-made Feed Material: Agglomerated potato flake Process Throughput: 1,750 lb/hr Process Equipment or Air Pollution Control Equipment: Process equipment (product recovery)	<u>CYCLONE Stack:</u> Stack Height: 44.08 feet Non-vertical discharge Modeled: Stack Exit Diameter: 0.0033 feet Exhaust Flow Rate: 1.7E-06 acfm Exit Gas Temperature: 68°F (ambient)

<sup>a</sup> Exit diameters and flow rates given in application are the modeled values, which used DEQ guidance default velocities and diameters to account for the presence of a cap (for the Drum Dryers) and modeling the vertical National Dryer stacks as horizontal releases. Actual stack diameters shown were calculated from stack areas given in the December 23, 2004 source test report.

## 5.2 Emissions Inventory

The total estimated emissions of criteria pollutants from this facility—including changes from this project—are shown in Table 5.2. Emissions in the table constitute the permitted emissions from this facility, excluding fugitive emissions. Emission factors for the Flaker Drum Dryers, National Dryers, and Fluidized Bed Dryer emission factors were based on source tests conducted November 17-23, 2004, as approved in an April 7, 2005, letter from DEQ to RDO's predecessor, Blaine Larson Farms. The detailed emissions inventory for this facility is included in Appendix B. As noted in the application, emissions estimates for Boiler No. 1 are based on the following assumptions:

Boiler No. 1:

- Emission factor for PM/PM<sub>10</sub> is based on meeting the NSPS criteria of 0.03 lb/MMBtu.
- Scrubber efficiency for SO<sub>2</sub> is 92%.
- Estimates are for burning residual fuel oil with 1.75% sulfur.



**Table 5.2 SUMMARY OF FACILITY-WIDE EMISSIONS INVENTORY**

	PM <sub>10</sub>		VOC		SO <sub>2</sub>		NO <sub>x</sub>		CO	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Boiler No. 1	4.50	19.71	1.33	5.84	22.88	100.22				
Boiler No. 2	0.05	0.21	0.04	0.15	0.004	0.02				
Tote Dump Station Cyclone	0.07	0.29								
Flaker Drum Dryers 1 – 12 (emissions for each dryer)	1.95	8.54			0.01	0.05				
National Dryer Process Emissions	1.71	7.49			0.081	0.35				
Fluidized Bed Dryer	3.53	15.48	0.02	0.11	0.09	0.38				
Flake Packaging Bulk Line	0.12	0.53								
Flake Packaging Line	0.08	0.35								
Flake Packaging Torit Line	0.08	0.35								
Flake Packaging Drum Negative Air Baghouse	0.18	0.79								
National Dryer A1, A2, B, C (emissions for each dryer)	0.46	2.02	0.02	0.09	0.06	0.26	0.55	2.39	0.30	1.32
Propane Heaters	0.03	0.12	0.02	0.09						
Tanks (3)				0.0012						
<b>TOTAL</b>	<b>35.59</b>	<b>155.88</b>	<b>1.49</b>	<b>6.53</b>	<b>23.47</b>	<b>102.82</b>	<b>53.11</b>	<b>232.60</b>	<b>7.63</b>	<b>33.42</b>

Detailed emissions estimates for the total uncontrolled emissions of toxic air pollutants (TAPs) are included in Appendix B. TAPs for which uncontrolled emissions exceeded the applicable screening emission level (EL), and which therefore required modeling, are summarized in Table 5.3.

**Table 5.3 SUMMARY OF  
FACILITY-WIDE TAPs INVENTORY**

	Emission Rate (lb/hr)	EL (lb/hr)
<b>Noncarcinogenic TAPs</b>		
Cobalt	6.27E-03	3.3E-03
Phosphorus	9.85E-03	7.0E-03
Vanadium	3.33E-02	3.0E-03
<b>Carcinogenic TAPs</b>		
Arsenic	1.38E-03	1.5E-06
Beryllium	2.88E-04	2.8E-05
Cadmium	3.20E-04	3.7E-06
Chromium VI	2.58E-04	5.6E-07
Formaldehyde	3.65E-02	5.1E-04
Nickel	6.24E-05	2.7E-05
POM (7-PAH Group)	1.22E-05	2.0E-06

### 5.3 Modeling

DEQ conducted verification modeling of the results provided in the application and determined that the permittee had demonstrated compliance with the NAAQS and TAPs standards. The detailed modeling memo is included as Appendix C. Tables 5.4 and 5.5 summarize the results of the full impact analysis for criteria pollutants and for TAPs.

**Table 5.4 FULL IMPACT ANALYSIS RESULTS FOR CRITERIA POLLUTANTS**

Pollutant	Averaging Period	Maximum Modeled Concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup>	Background Concentration ( $\mu\text{g}/\text{m}^3$ )	Total Ambient Impact ( $\mu\text{g}/\text{m}^3$ )	NAAQS <sup>b</sup> ( $\mu\text{g}/\text{m}^3$ )	Percent of NAAQS
PM <sub>10</sub> <sup>c</sup>	24-hour	38.7 <sup>d</sup>	73	111.7	150	75
	Annual	2.9 <sup>e</sup>	26	28.9	50	58
SO <sub>2</sub>	3-hour	64.2 <sup>f</sup>	34	98.2	1,300	8
	24-hour	12.5 <sup>f</sup>	26	38.5	365	11
	Annual	2.53	8	10.1	80	13
CO	1-hour	66 <sup>e</sup>	NA - impact below Significant Contribution Levels (SCLs)			
	8-hour	15 <sup>e</sup>	NA - impact below SCLs			
NO <sub>2</sub>	Annual	4.88 <sup>e</sup>	17	21.88	100	22

<sup>a</sup>. Micrograms per cubic meter

<sup>b</sup>. National ambient air quality standards

<sup>c</sup>. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

<sup>d</sup>. Maximum 6<sup>th</sup> high modeled concentration using 5 years of meteorological data

<sup>e</sup>. Maximum modeled concentration

<sup>f</sup>. Maximum 2<sup>nd</sup> high modeled concentration obtained by modeling each of 5 years of meteorological data separately

<sup>g</sup>. Impacts are below SCLs, therefore a full impact analysis was not required

**Table 5.5 FULL IMPACT ANALYSIS RESULTS FOR TAPS**

TAP	Averaging Period	Maximum Modeled Concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup>	AAC/AACC <sup>b</sup> ( $\mu\text{g}/\text{m}^3$ )	Percent of AAC/AACC
<b>Noncarcinogenic TAPs</b>				
Cobalt	24-hour	0.00399	2.5	0.16
Phosphorus	24-hour	0.00626	5	0.13
Vanadium	24-hour	0.0211	2.5	0.8
<b>Carcinogenic TAPs</b>				
Arsenic	Annual	1.30E-4	2.3E-4	56
Beryllium	Annual	<1.0E-5	4.2E-3	<0.2
Cadmium	Annual	4.00E-5	5.6E-4	7
Chromium 6+	Annual	2.00E-5	8.3E-5	24
Formaldehyde	Annual	3.32E-3	7.7E-2	4
Nickel	Annual	1.00E-5	4.2E-3	0.2
POM	Annual	<1.0E-5	3.0E-4	<3

<sup>a</sup>. Micrograms per cubic meter

<sup>b</sup>. Acceptable Ambient Concentration (AAC) or Acceptable Ambient Concentration for a Carcinogen (AACC)

## 5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this T2 and PTC.

IDAPA 58.01.01.201.....Permit to Construct Required

Replacement of the 99 MMBtu/hr nameplate rated burner with a burner rated at 150 MMBtu/hr for Boiler No. 1, increasing the allowable sulfur content of the fuel oil from 0.5% to 1.75%, and construction of a third fuel oil storage tank constitute modifications in accordance with IDAPA 58.01.01.006 because these changes will increase emissions from the facility. A PTC is therefore required.

IDAPA 58.01.01.203.03.02.....Demonstration of Preconstruction Compliance with NAAQS

Compliance with the NAAQS has been demonstrated in the permit application. Refer to the modeling section above and the modeling report in Appendix C for details.

IDAPA 58.01.01.203.03 and 210.....Demonstration of Preconstruction Compliance with Toxics Standards

For each modification project after June 30, 1995, the TAP rules apply only to the increase in TAP emissions associated with that particular modification. The increase in the heat input capacity for Boiler No. 1 and the installation of a third fuel storage tank result in incremental increases in TAPs emissions.

Compliance with toxics standards has been demonstrated in the permit application. Refer to the modeling section above and the modeling report in Appendix C for details.

IDAPA 58.01.01.204.....Permit Requirements for New Major Facilities or Major Modifications in Attainment or Unclassifiable Areas

RDO is not a major facility for purposes of the NSR/PSD program as defined under IDAPA 58.01.01.205.01 [40 CFR 52.21(b)(1)(a), (b), and (c)] because the facility is not a designated facility, and the potential to emit for any regulated NSR pollutant will be limited to less than 250 tons per year by federally enforceable conditions in this Tier II/PTC permit.

IDAPA 58.01.01.676-677 .....Fuel Burning Equipment – Particulate Matter

For the purposes of this section of the rules, all fuel burning equipment at the RDO facility commenced operation after October 1, 1979. IDAPA 58.01.01.676 applies to Boiler No. 1 because the input heat capacity for each is greater than 10 MMBtu/hr. IDAPA 58.01.01.677 applies to Boiler No. 2 and each dryer and each propane heater because the input heat capacity for each of these emission units is less than 10 MMBtu/hr. Compliance will be demonstrated by operating Boiler No. 1 in accordance with the NSPS conditions regarding PM standards, and by firing only natural gas or propane in Boiler No. 2, the dryers, and the propane heaters.

IDAPA 58.01.01.700-703 .....Particulate Matter – Process Weight Limitations

Process weight limitations do not apply to Boiler No. 1, Boiler No. 2, or the fuel storage tanks. Compliance with PM process weight limitations is demonstrated in Section 5.2 of the permit application for all other emission units. Process weights used in this application for individual processes are the same or greater than the values used in superseded Tier II/PTC Nos. T2-030514 and P-040524.

40 CFR 60 Subpart Db.....NSPS for Industrial, Commercial, and Institutional Steam Generating Units

40 CFR 60.40b(a), Applicability.

Boiler No. 1 was described as being new when installed in 1996, therefore, for purposes of assessing applicability of this subpart the boiler was constructed in 1996. When installed, the rated heat input capacity for Boiler No. 1 was 143 MMBtu/hr. Permits T2-030514, issued June 2, 2004, and P-040524, issued March 7, 2005, reflected that Boiler No. 1 was an “affected facility” under Subpart Db, because it was a steam generating unit that commenced construction, modification, or reconstruction after June 19, 1984, and had a heat input capacity from fuels combusted in the steam generating unit of greater than 29 MW (100 MMBtu/hr).

In 2005, the burner was replaced with a new Todd® burner with a rated heat input capacity less than 100 MMBtu/hr when burning either #6 fuel oil or propane. Based on test results using the new burner with a nameplate rating of 99 MMBtu/hr, EPA approved derating this boiler so that the unit was subject to the requirements of 40 CFR 60 Subpart Dc rather than Subpart Db. Subpart Dc requirements were imposed on the modified boiler through a Consent Order issued February 17, 2006, for Case No. E-060001.

The current permitting action is based on rerating Boiler No. 1 to 150 MMBtu/hr by replacing the Todd® burner with one with a nameplate rating of 150 MMBtu/hr. With this change, Boiler No. 1 will again be subject to the requirements of 40 CFR 60 Subpart Db.

The changeout of the burner constitutes a modification to the facility, which is defined in 40 CFR 60.2 as “any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted...” because the increase in the input heat capacity results in increased emissions of all criteria pollutants. This modification will not occur until this Tier II/PTC permit is issued in 2006. This change does not constitute “reconstruction” of the boiler, as defined in 40 CFR 60.15.

#### 60.41b, Definitions.

Boiler No. 1 will be modified after February 28, 2005, so *very low sulfur oil* is defined as oil that contains no more than 0.3 weight percent sulfur, or that, when combusted without sulfur dioxide emission control, has a sulfur dioxide emission rate equal to or less than 140 ng/J (0.32 lb/MMBtu) heat input.

#### 60.42b, Standard for Sulfur Dioxide.

The NSPS SO<sub>2</sub> standard does not apply when burning natural gas or propane.

Percent reduction requirements and an emission limit for SO<sub>2</sub> are specified in 60.42b(a), except as provided in paragraphs (b), (c), (d), (j), or (k). Boiler No. 1 fuels and operations do not meet the criteria in paragraphs (b), (c), or (d), so those do not apply. In addition, paragraphs (f) and (h) do not apply.

Paragraph 60.42b(a) limits SO<sub>2</sub> emissions to no more than 87 nanograms per Joule (ng/J) (0.20 lb/MMBtu) or 10 percent of the potential SO<sub>2</sub> emission rate (a 90 percent reduction) and the emission limit determined according to a specified formula. Since coal is not used in this boiler, the emission limit equation in 60.42b(a) reduces to simply  $E_s = (K_b * H_b) / H_b = K_b = 340 \text{ ng/J}$  (0.80 lb/MMBtu).

Preconstruction compliance with the 90 percent reduction requirement is demonstrated based on the scrubber manufacturer guarantee of a minimum 92% SO<sub>2</sub> removal efficiency. Compliance with the 0.80 lb/MMBtu emission limit is demonstrated based on the scrubber manufacturer guarantee of 0.2 lb/MMBtu heat input, and as follows based on emissions estimates provided in the permit application:

Emissions with scrubber of 22.88 lb/hr / Heat Input Capacity of 150 MMBtu/hr = 0.15 lb/MMBtu

The provisions of 60.42b(k) do not apply because the affected facility was not constructed or reconstructed after February 28, 2005. Modification after this date does not trigger requirements under paragraph (k). However, in supplemental application materials received by DEQ on July 13, 2006, the permittee committed to meet the 0.2 lb/MMBtu (87 ng/J) emission limit or the 92% reduction and 1.2 lb/MMBtu emission limit specified in paragraph (k).

Paragraph 60.42b(e) applies, which requires that compliance with the emission limits, fuel oil sulfur limits, and/or percent reduction requirements for SO<sub>2</sub> emissions be determined on a 30-day rolling average basis.

Paragraph 60.42b(g) applies, which requires that the SO<sub>2</sub> emission limits and percent reduction requirements apply at all times, including periods of startup, shutdown, and malfunction.

Paragraph 60.42b(i) applies, which allows the use of very low sulfur oil (maximum 0.3 weight percent sulfur) or natural gas when the SO<sub>2</sub> control system is not being operated because of malfunction or maintenance of the SO<sub>2</sub> control system.

Paragraph 60.42b(j) applies only when only very low sulfur oil is burned. During these periods, percent reduction requirements are not applicable, and compliance is demonstrated by (1) following the performance testing procedures as described in 60.45b(c) or 60.45b(d), and following the monitoring procedures as described in 60.47b(a) or 60.47b(b) to determine the sulfur dioxide emission rate or fuel oil sulfur content; or (2) maintaining fuel receipts as described in 60.49b(r).

#### 60.43b, Standard for Particulate Matter.

The PM standards contained in 60.43b(a), (b), (c), (d), (e), (h)(3), and (h)(4) do not apply.

Per 60.43b(f), on and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, emissions from the boiler shall not exceed 20% opacity (six-minute average), except for one six-minute period per hour of not more than 27% opacity. Per 60.43b(g), this opacity standard applies at all times, except during periods of startup, shutdown, and malfunction.

Per 60.43b(h)(1), for an affected facility that commences construction, reconstruction, or modification after February 28, 2005, and that combusts oil, [or] gas, on or after the date on which the performance test required to be conducted under §60.8 is completed, PM emissions shall not exceed 13 ng/J (0.030 lb/MMBtu) heat input.

As an alternative to meeting 60.43b(h)(1), the owner or operator of an affected facility for which modification commenced after February 28, 2005, may elect to meet paragraph 60.43b(h)(2), which states that on or after the date on which the performance test required to be conducted under §60.8 is completed, PM emissions shall be limited to no more than 22 ng/J (0.051 lb/MMBtu) heat input from the combustion of oil or gas, and 0.2 percent of the combustion concentration (99.8 percent reduction) when combusting oil or gas.

#### 60.44b, Standard for NO<sub>x</sub>.

The NO<sub>x</sub> standards of 60.44b(a) apply. Comments received from RDO's predecessor (Larsen Farms) on March 9, 2004, indicated that the heat release rates for the boiler are: 77,600 Btu/hr-ft<sup>3</sup> for natural gas; 73,900 Btu/hr-ft<sup>3</sup> for diesel fuel oil; and 73,400 Btu/hr-ft<sup>3</sup> for #6 fuel oil. Information provided in RDO's supplemental application materials on July 13, 2006, reconfirmed the heat release rate for No. 6 fuel oil. On this basis, Boiler No. 1 has a "high heat release rate" as defined by 40.41b since the heat release rate is greater than 70,000 Btu/hr-ft<sup>3</sup>.

The NO<sub>x</sub> standards apply at all times including periods of startup, shutdown, or malfunction, and compliance shall be determined on a 30-day rolling average per 60.44b(h) and (i).

The NO<sub>x</sub> standards contained in 60.44b(b) through 60.44b(g), and 60.44b(j), (k) and (l) do not apply. Paragraph 60.44b(b) does not apply because simultaneous combustion of oil and gas has not been proposed. Paragraph 60.44b(l) does not apply because the boiler was constructed prior to July 9, 1997.

#### 60.45b, Compliance and Performance Test Methods and Procedures for SO<sub>2</sub>.

The requirements contained in paragraphs (d) and (e) of this section do not apply.

Per 60.45b(j), when combusting only very low sulfur fuel oil, the compliance and performance test methods and procedures contained in 60.45b do not apply if the owner or operator obtains fuel receipts as described in 60.49b(r). Per 60.45b(k), when combusting only very low sulfur oil, compliance may be demonstrated by maintaining records of fuel supplier certifications of the sulfur content of fuels burned.

When burning any fuel other than very low sulfur fuel oil, the requirements in this section which apply are 60.45b(a), 60.45b(b), 60.45b(c), 60.45b(f), 60.45b(g), 60.45b(h), and 60.45b(i).

It is important to note that EPA has identified typographical errors in 60.45b (see Applicability Determination Index document, Control Number NN06, in Appendix A). EPA provides the following correction: “Section 60.45b(c)(3)(ii) should reference Section 60.45b(c)(3)(i) [not 60.45b(b)(3)(i)]. Section 60.45b(c)(4) and Section 60.45b(c)(5) should reference Section 60.45b(c)(3) [not 60.45b(b)(3)].”

#### 60.46b, Compliance and Performance Test Methods and Procedures for PM and NO<sub>x</sub>.

The requirements contained in paragraphs 60.46b(e)(3), (f), (g), and (h) do not apply.

Per 60.46b(i), when combusting only very low sulfur oil, compliance may be demonstrated by maintaining records of fuel supplier certifications of the sulfur content of fuels burned.

Applicable PM and opacity requirements include 60.46b(a), (b), and (d). If a PM CEMS is used, compliance shall be determined in accordance with requirements contained in 60.46b(j)(1) through (j)(13).

Applicable NO<sub>x</sub> requirements include 60.46b(a), (c), and (e). In particular, for fuels with a fuel nitrogen content less than 0.3%, 60.46b(e)(4) will apply. If the fuel nitrogen content of residual fuel is not sampled and analyzed as specified in 60.49b(e), 60.46b(e)(2) requirements will apply.

It is important to note that the EPA has identified a typographical error in 60.46b(e)(5) (see Applicability Determination Index document, Control Number NN06, in Appendix A). The correct version of this requirement is: “If the owner or operator of an affected facility which combusts residual oil does not sample and analyze the residual oil for nitrogen content, as specified in 60.49b(e), the requirements of paragraph (2) [not iii] of this section apply and the provisions of paragraph (4) [not iv] of this section are inapplicable.”

#### 60.47b, Emission Monitoring for SO<sub>2</sub>.

SO<sub>2</sub> emissions monitoring is not required when burning natural gas or propane.

Emissions monitoring for SO<sub>2</sub> for Boiler No. 1 must include either a CEMS for measuring SO<sub>2</sub> emissions and either O<sub>2</sub> or CO<sub>2</sub> concentrations per 60.47b(a), or the owner or operator may elect to use the alternative method specified in 60.47b(b), or an alternative approved by the EPA per 60.13(h)(i)(1). Either of these options would be considered a continuous compliance determination method for the purpose of CAM avoidance (see the 40 CFR 64 discussion below).

The monitoring requirements in 60.47b(c), (d), and (e) apply if the facility uses a CEMS to monitor SO<sub>2</sub> emissions.

Per 60.47b(f) and (g), emissions monitoring is not required when burning very low sulfur fuel oil, if fuel receipts are obtained as described in 60.49b(r), and fuel supplier certifications are maintained. Although the NSPS emission limit and percent reduction requirement do not apply when burning very low sulfur fuel oil, Boiler No. 1 would still be subject to an SO<sub>2</sub> emissions limit to comply with the NAAQS.

To avoid triggering CAM, a continuous compliance determination method for SO<sub>2</sub> (i.e., CEMS plus O<sub>2</sub> or CO<sub>2</sub> measurement, or the alternative sampling and analysis method) must be used even when burning very low sulfur fuel oil.

#### 60.48b, Emission Monitoring for PM and NO<sub>x</sub>.

The opacity standards of 60.43b(f) and (g) apply, therefore the requirements of 60.48b(a) for installation of a continuous opacity monitoring system (COMS) apply. Given the difficulties inherent in using a COMS in conjunction with a wet scrubber, one of the following options must be met to meet the requirement for continuous opacity monitoring:

- Install and operate a PM CEMS per 60.48b(k); or
- Use an alternative method approved by the EPA per 60.13(h)(i)(1).

Per 60.48b(j), PM emissions monitoring is not required when burning very low sulfur fuel oil or liquid or gaseous fuels with potential SO<sub>2</sub> emission rates of 140 ng/J (0.32 lb/MMBtu) heat input or less, if fuel supplier certifications of the fuel sulfur content are maintained.

The NO<sub>x</sub> monitoring requirements specified in 60.48b(g) apply since the boiler heat input capacity is less than 250 MMBtu/hr and it will have an annual capacity factor greater than 10% for “residual oil having a nitrogen content of 0.30 weight percent or less, natural gas, distillate oil, or any mixture of these fuels.” Therefore, one of the following options must be met per 60.48b(g):

- Install and operate a continuous monitoring system for measuring NO<sub>x</sub> emissions per 60.48b(b) through 60.48b(f), or
- Monitor boiler operating conditions and “predict” NO<sub>x</sub> emission rates pursuant to a plan submitted and approved per 60.49b(c). With the May 22, 2006 delegation of authority to Idaho for NSPS, this predictive emissions monitoring system (PEMS) plan shall be submitted to Idaho DEQ for approval rather than to the EPA.

The following requirements of this section do not apply: 60.48b(b)(2), 60.48(e)(1), 60.48b(h), and 60.48b(i).

#### 60.49b, Reporting and Recordkeeping Requirements.

All paragraphs of this section apply to Boiler No. 1 except as noted below.

Compliance with 60.49b(c) will be required only if the facility elects to use a PEMS instead of a CEMS for monitoring NO<sub>x</sub> emissions.

The reporting requirements of 60.49b(l) do not apply because the testing requirements of 60.45b(d) do not apply to this Boiler. 60.49b(p) and (q) do not apply since the NO<sub>x</sub> requirements of 60.44b(j) and (k) do not apply.

The following requirements of this section do not apply: 60.49b(l), 60.49b(n), 60.49(p), 60.49b(q), 60.49b(s), 60.49b(t), and 60.49b(u).

The following information applies to the SO<sub>2</sub> reporting requirements under 60.49b(j).

The reporting requirements of 60.49b(k) do not apply when the when the SO<sub>2</sub> compliance and performance testing standards under 60.45b don’t apply. This occurs, per 60.45b(j), when the facility combusts only very low sulfur oil and fuel receipts are obtained in accordance with 60.49b(r). If the facility is not able to obtain fuel receipts in accordance with 60.49b(r), then the reporting requirements of 60.49b(k) apply.

The reporting requirements of 60.49b(m) do not apply when the when the emission monitoring requirements under 60.47b don’t apply. This occurs, per 60.47b(f), when the facility combusts only very low sulfur oil (which is required by the permit) and fuel receipts are obtained in accordance with 60.49b(r). If the facility is not able to obtain fuel receipts in accordance with 60.49b(r), then the reporting requirements of 60.49b(m) apply.

40 CFR 60.1 through 60.19, NSPS General Provisions. The NSPS General Provisions are given by 40 CFR Part 60 Subpart A. The General Provisions which apply to the boiler project have been added to the permit. The following requirements in this subpart do not apply: 60.18.

40 CFR 60 Subpart Kb.....New Source Performance Standards (NSPS) of Performance for Volatile Organic Liquid Storage Vessels (including petroleum liquid storage vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984.

The two existing and one new 30,000-gallon (113.6 cubic meters [ $\text{m}^3$ ]) fuel oil storage tanks have capacities between 75  $\text{m}^3$  and 151  $\text{m}^3$  and will store a liquid with a maximum true vapor pressure less than 15.0 kilopascals (kPa). Note: the maximum true vapor pressure of the fuel oil ranges from approximately 0.055 kPa (Tier II application, p. 4-15, which appears to be for residual fuel oil) to 0.067 kPa (a typical maximum pressure for distillate fuel oil). The tanks are exempt from most of the requirements of this Subpart, per 60.110b(b).

The tank capacities are all greater than or equal to 75  $\text{m}^3$ , which meets the applicability requirements of 40 CFR 60.110b (a). The facility must comply with 60.116b(a) and (b), to keep readily accessible records of the tank dimensions and capacity. This requirement was placed in Section 2 of the permit.

No information was provided to indicate that the tanks are equipped with a closed vent system and control device or with emissions reduction equipment. 60.116b(d) applies, which requires the facility to notify DEQ within 30 days when the maximum true vapor pressure of the liquid exceeds 27.6 kPa. However, it is improbable that fuel oil vapor pressure would exceed this threshold even during extremely hot weather.

40 CFR 61 and 63 .....National Emission Standards for Hazardous Air Pollutants & MACT

There are no requirements under 40 CFR Parts 61 and 63 that apply to this facility.

40 CFR 64 .....Compliance Assurance Monitoring (CAM)

CAM applicability was evaluated on a pollutant-specific basis for each emissions unit as summarized in Table 5-1. Boiler No. 1 is exempt from CAM requirements under 64.2(b) because the Tier I permit will require the use of a continuous compliance determination method for  $\text{SO}_2$  when combusting distillate or residual fuel oil. Boiler No. 2 is exempt from CAM requirements because it does not meet the applicability criteria.



**Table 5.1 CAM APPLICABILITY SUMMARY**

<b>Pollutant Specific Emissions Unit</b>	<b>40 CFR 64.2(a)(1) Emission Limits and Standards<sup>a</sup></b>	<b>40 CFR 64.2(a)(2) Controls Used for Compliance?</b>	<b>40 CFR 64.2(a)(3) Potential pre-control emissions &gt; 100 TPY?</b>	<b>40 CFR 64.2(b)(1)(i) Exemption?</b>	<b>40 CFR 64.2(b)(1)(vi) Exempt because Tier I requires continuous compliance determination method?</b>
Boiler No. 1  burning Residual Oil or ASTM #2 Oil	SO <sub>2</sub>				
	NAAQS NSPS Subpart Db	Yes. Wet scrubber	Yes. 1,253 TPY	Not Exempt. NSPS Subpart Db was proposed prior to November 15, 1990.	Yes. Exempt as long as Tier I permit requires a continuous compliance determination method per NSPS Subpart Db, 60.47b.
	PM NSPS Subpart Db IDAPA 58.01.01.676 (PM grain loading) PM <sub>10</sub> NAAQS	Yes. Wet scrubber/ venturi	No. 94.9 TPY (PM)	n/a	n/a
	NO <sub>x</sub> NSPS Subpart Db	No.	n/a	n/a	n/a
Boiler No. 1  burning ASTM #1 Oil (Very low sulfur oil, S ≤ 0.3%)	SO <sub>2</sub> NAAQS				n/a
	(Note: NSPS Subpart Db, 60.42b(k)(1): SO <sub>2</sub> limits don't apply when burning very low S oil)	Yes. Wet scrubber	Yes. 215 TPY		
	PM NSPS Subpart Db IDAPA 58.01.01.676 (PM grain loading)	Yes. Wet scrubber/ venturi	No. 71 TPY (PM)	n/a	n/a
	NO <sub>x</sub> NSPS Subpart Db	No.	n/a	n/a	n/a
Boiler No. 2	IDAPA 58.01.01.677	No.	n/a	n/a	n/a
	(PM grain loading)	No.	n/a	n/a	n/a

<sup>a</sup> Federally enforceable permit conditions limit SO<sub>2</sub> and PM<sub>10</sub> emissions to levels that were modeled to demonstrate compliance with NAAQS.

Pre-Control SO<sub>2</sub> Emissions (TPY) = (1,041 gal/hr)(8760 hr/yr)(ton/2000 lb)(157S/1000gal)  
 Boiler No. 1, 1.75% S residual fuel oil: SO<sub>2</sub> = 1,253 TPY  
 Boiler No. 1 0.5% S distillate fuel oil (ASTM #2): SO<sub>2</sub> = 358 TPY  
 Boiler No. 1 0.3% S distillate fuel oil (ASTM #1): SO<sub>2</sub> = 215 TPY

Pre-Control PM Emissions (TPY) = (1,041 gal/hr)(8760 hr/yr)(ton/2000 lb)(EF<sub>filterable</sub> + EF<sub>condensable</sub>)  
 Boiler No. 1, 1.75% S residual oil: EF = (9.19S + 3.22)/10<sup>3</sup> gal = 0.0208 PM = 94.9 TPY  
 Boiler No. 1, 0.5% S distillate fuel oil (ASTM #2): EF = (2/10<sup>3</sup> gal) + (1.3/10<sup>3</sup> gal) = 0.0033 PM = 15 TPY

## 5.5 Fee Review

A Tier II operating permit processing fee of \$10,000 is required in accordance with IDAPA 58.01.01.407 because the facility is a stationary source with permitted emissions of 100 tons or more per year, as shown in Table 5.6.

The RDO facility near Dubois is a major facility as defined in IDAPA 58.01.01.008. Therefore, Tier I registration fees are applicable in accordance with IDAPA 58.01.01.387. As of May 12, 2007, the current balance due for Tier I fees is \$0.00.

**Table 5.6 Tier II Processing Fee Summary**

<b>Emissions Inventory</b>	
<b>Pollutant</b>	<b>Permitted Emissions</b>
NO <sub>x</sub>	232.6
SO <sub>2</sub>	102.82
CO	33.42
PM <sub>10</sub>	148.29
VOC	6.53
HAPS	0.29
<b>Total:</b>	<b>523.95</b>
Fee Due	<b>\$10,000.00</b>

## **5.6 Regional Review of Draft Permit**

Electronic copies of the facility draft permit and statement of basis were provided to the Idaho Falls Regional Office on December 11, 2006. Responses were received December 13 stating they had no comments.

## **5.7 Facility Review of Draft Permit**

Electronic copies of the facility draft permit and statement of basis were provided to the permittee on December 15, 2006. Comments were received on January 12, 2007. DEQ determined that comments that constituted a change of scope (i.e., raising the Boiler No. 1 stack height from 45 feet to 101 feet, increasing the nickel content of the fuel oil, and rerunning the modeling for the higher nickel emissions) must be submitted as a separate PTC project.

## **6. PERMIT CONDITIONS**

This section describes only those permit conditions that have been revised, modified, or deleted as a result of this permit action. All other permit conditions remain unchanged. Permit conditions related to the modified permit are identified as Permit Conditions. Permit conditions related to the existing permit(s) are identified as Existing Permit Conditions.

### **Permit Section 2. Facility Wide Conditions**

Existing Permit Condition 2.9 (excess emissions), 2.11 (performance testing), and 2.12 (monitoring and recordkeeping) were deleted. These requirements are now contained in General Provision Nos. 8, 6, and 7, respectively.

Existing Permit Condition 2.13, reports and certifications, was renumbered to Permit Condition 2.10 and modified to delete the certification requirement. Certification requirements are now contained in General Provision No. 9.

Existing Permit Condition 2.14 (obligation to comply) was deleted. This requirement is now contained in General Provision No. 3.

Existing Permit Condition 2.16, fuel oil sulfur content, was renumbered to Permit Condition 2.12, and modified to specify a maximum sulfur content of 1.75% by weight for residual fuel oil instead of referring to Section 3 of the permit.

Permit Condition 2.13 was added to require maintaining documentation of the sulfur content of fuel oil on an as-received basis.

Existing Permit Condition 2.17, NSPS Subpart Kb, Fuel Oil Storage Tanks, was renumbered to 2.14, and changed to reflect that there will now be three fuel oil storage tanks, not two.

Permit Condition 2.15, Control of Property within the Ambient Air Boundary, was added to require exclusive access control over properties included within the modeled ambient air boundary.

### **Permit Section 3. Boiler No. 1.**

The title was corrected from “Wabash Power Equipment” to “Nebraska D-Series.”

#### ***Emissions Limits***

Daily limits for SO<sub>2</sub> and PM<sub>10</sub> were revised based on the emission rate(s) for which NAAQS compliance was demonstrated in the application:

Existing Permit Condition 3.2. SO<sub>2</sub> emission limits reduced from 1,680 lb/day and 244 tons/yr to 549 lb/day (based on 92% scrubber efficiency, 22.88 lb/hr x 24 hr). Modeling demonstrated NAAQS compliance for running at maximum capacity for 8760 hours per year (emissions of 100.2 tons/yr at 22.88 lb/hr x 8760 hr). The daily limit inherently restricts annual emissions, so the annual limit was deleted.

Permit Condition 3.3. PM<sub>10</sub> emission limits reduced from 199 lb/day to 108 lb/day (based on an EF of 0.03 lb/MMBtu and 8% scrubber/venturi efficiency, 4.5 lb/hr x 24 hr). Modeling demonstrated NAAQS compliance for running at maximum capacity for 8760 hours per year (emissions of 19.71 tons/yr at 4.5 lb/hr x 8760 hr). The daily limit inherently restricts annual emissions, so no annual limit was imposed.

NSPS emission limits (Permit Conditions 3.4 - 3.7, 3.8, and 3.9 - 3.11) mirror the conditions contained in Permit No. T2-050511, issued January 13, 2006, prior to derating this boiler from Subpart Db to Subpart Dc, but have been revised to reflect current NSPS Subpart Db requirements, burning fuel oil with a sulfur content as high as 1.75% instead of burning only very low sulfur oil, and new requirements for an affected facility that will have been modified after February 28, 2005. See the detailed discussion of NSPS applicability in the regulatory review in Section 5.4 above.

Existing Permit Condition 3.4. Revised to reflect current 40 CFR 60.42b(k) emission limits and percent reduction requirements for SO<sub>2</sub> in accordance with the limits requested in the application. See the discussion in the regulatory review above.

Permit Condition 3.8. New condition added to require 40 CFR 60.43b(h)(1) and (h)(2) emission limits and percent reduction requirement for PM<sub>10</sub> when combusting oil or gas.

Existing Permit Conditions 3.8 through 3.14 were renumbered as 3.9 through 3.15.

#### ***Operating Requirements***

Permit Condition 3.13. Deleted the limitation that only very low sulfur fuel oil be used in the boiler during normal operations, and deleted the definition of very low sulfur fuel oil. Added the 40 CFR 60.42b(i) option to burn only natural gas, propane, or low sulfur fuel oil when the SO<sub>2</sub> system has malfunctioned or is down for maintenance. Note that the text of that rule specifies “natural gas,” but does not specifically mention propane. Natural gas is defined in 60.41b as including liquid petroleum gas (LPG) as defined in ASTM D1835, which includes propane. Included fuel oil that meets the specifications for S500 Grade biodiesel as an approved fuel.

Permit Condition 3.14. Revised the fuel oil throughput to apply to all fuel oil, not just very low sulfur fuel oil, and increased the allowable fuel oil throughput from 21,336 gallons per day to 24,984 gallons per day (1,041 gal/hr x 24 hrs). Modeling demonstrated NAAQS and TAPs compliance for operation at full capacity for 8,760 hours per year using high sulfur fuel oil. The daily limit inherently restricts the

annual fuel usage to the modeled amount; the existing annual usage limit was therefore deleted. A throughput limit on propane or natural gas was not necessary (lower lb/hr emission rates than for high sulfur residual fuel oil). A separate emission limit was not imposed for biodiesel use. Emissions of all criteria pollutants except NO<sub>x</sub> are expected to be lower when burning biodiesel than when burning ASTM grade fuel oil. NO<sub>x</sub> emissions may be about 10 percent higher than when using ASTM grade fuel oil. Facility-wide NO<sub>x</sub> emissions were estimated at 22 percent of the annual NAAQS. An increase in emissions of perhaps 10% per year would not be expected to exceed the NO<sub>x</sub> NAAQS.

Existing Condition 3.15. Existing Permit Condition 3.15 describing required stack height modifications was deleted. Stack heights and configurations were modified as required, per a January 5, 2006 letter from RDO to Aaron Swift at the DEQ Idaho Falls Regional Office.

Permit Condition 3.15. Changed to reflect the increased allowable fuel sulfur content from 0.5 to 1.75 weight percent per the Consent Order. Per the application, emissions estimates for nickel were based on the maximum fuel oil nickel concentration provided by the fuel supplier. The allowable concentration of nickel was therefore reduced from 0.00034 pounds per 1,000 gallons to 1.67E-06 pounds per 1,000 gallons. Added the 40 CFR 60.41b definition for very low sulfur fuel applicable to a unit that will have been modified after February 28, 2005.

### ***Monitoring and Recordkeeping Requirements***

Existing Conditions 3.16 and 3.17, which specify monitoring and recordkeeping required when very low sulfur fuel is combusted, were combined.

Permit Condition 3.17 is Existing Permit Condition 3.22, which was moved to consolidate all the fuel recordkeeping and the phrase “in accordance with 40 CFR 60.49b(e) and as specified by the EPA” was deleted from the last sentence to reflect current wording in the rule.

Existing Condition 3.18 was revised to broaden the requirement to maintain fuel oil receipts for all grades of fuel oil to demonstrate compliance with the fuel oil sulfur and nickel limits. The fuel sulfur limit specified in ASTM D6751 for S500 Grade biodiesel is 0.05%.

Permit Condition 3.19 is Existing Permit Condition 3.21, which was moved to consolidate all the fuel recordkeeping.

Permit Condition 3.20. Renumbered and revised existing condition 3.19 to include SO<sub>2</sub> emission monitoring requirements when burning fuel oil other than very low sulfur fuel oil.

Permit Condition 3.21 was added to clarify that PM emission monitoring is not required when burning very low sulfur fuel oil, as long as fuel sulfur content records are maintained, and to include PM emission (opacity) monitoring requirements when burning fuel oil other than very low sulfur fuel oil.

Existing Conditions 3.20 was renumbered to 3.22.

Existing Conditions 3.23 and 3.24, which required a continuous opacity monitoring system (COMS) and opacity recordkeeping was deleted. The requirements for PM emissions monitoring and recordkeeping is now contained in Permit Condition 3.21.

Existing Condition 3.25 was renumbered to 3.23.

Existing Condition 3.26 was renumbered to 3.24 and expanded to include SO<sub>2</sub> compliance and performance tests when burning fuel oil other than very low sulfur fuel oil.

Existing Conditions 3.27 through 3.30 were renumbered to 3.25 through 3.28. Permit Condition 3.28 was revised to reflect that the five-year records retention requirement is now contained in General Provision 7 instead of in Section 2.

### ***Reporting Requirements***

Existing Conditions 3.31 through 3.41 were renumbered to 3.29 through 3.39. In Permit Condition 3.30, the internal reference to Condition 3.26 was revised to refer to Condition 3.24.

Permit Condition 3.31 was revised to require that a predictive emissions monitoring system plan for NO<sub>x</sub> be submitted to DEQ rather than the EPA. On May 22, 2006, DEQ was delegated authority for implementing Subpart Db requirements.

### **Permit Section 5. Dryer Processes and Material Transfer Systems**

Existing Condition 5.3 was revised to reflect the modeled emission rates for each of these sources.

Existing Condition 5.4.1 was revised to increase the daily combined throughput for the Flaker Drums, Fluidized Bed Dryer, and National Dryer from 468,000 lb/day to 516,000 lb/day. The modeled emissions were based on this increased throughput.

Existing Conditions 5.11 through 5.15 were deleted. Existing Conditions 5.11 through 5.14 were “reserved,” and Condition 5.15 required notification to DEQ of the date all of the stack modifications were completed to comply with Existing Condition 3.15 (which has also been deleted). The permittee notified DEQ of the completion of the required stack height modifications in a January 5, 2006 letter to Aaron Swift of the DEQ Idaho Falls Regional Office.

### **Permit Section 6. Summary of Emission Rate Limits**

Emission rate limits in Table 6.1 for Boiler No. 1 were revised to reflect the current limits on SO<sub>2</sub> and PM<sub>10</sub> emissions imposed by Permit Conditions 3.2, 3.3, and 5.3.

## **7. PUBLIC COMMENT**

In accordance with IDAPA 58.01.01.404.01.c, a public comment period on the proposed Tier II operating permit and application materials will be provided. [For Final: The public comment period started on **DATE** and ended **DATE**. Comments regarding DEQ’s proposed action **WERE / WERE NOT** received.]

## **8. RECOMMENDATION**

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommend that RDO Processing, LLC be issued a proposed Tier II and PTC No. T2-060510 for the modifications to Boiler No. 1 and the addition of a third fuel oil storage tank. The project does not involve PSD requirements. An opportunity for public comment on the air quality aspects of the proposed permit shall be provided in accordance with IDAPA 58.01.01.404.01.c.

CR/bf

Permit No. T2-060510

## **Appendix A**

### **AIRS Information**

**T2-060510**

# AIRS/AFS<sup>a</sup> FACILITY-WIDE CLASSIFICATION<sup>b</sup> DATA ENTRY FORM

**Facility Name:** RDO Processing, LLC  
**Facility Location:** Dubois, Idaho  
**AIRS Number:** 033-00002

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO <sub>2</sub>	A		A				A	U
NO <sub>x</sub>	A		A				A	U
CO	B							U
PM <sub>10</sub>	B		B					U
PT (Particulate)	B							U
VOC	B							U
THAP (Total HAPs)	B							
			APPLICABLE SUBPART					
			Db	NONE	NONE			

<sup>a</sup> Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

<sup>b</sup> AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, **or** each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

**Appendix B**

**Emissions Inventory**

**T2-060510**



Emission Inventory													
Source	Pollutant												
	PM (w/o scrubber control for Boiler No. 1)		PM-10		VOC		SO <sub>2</sub>		NO <sub>x</sub>		CO		
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	
Boiler No. 1	4.50	19.71	4.50	19.71	1.33	5.84	22.88	100.22	48.93	214.30	5.21	22.80	
Boiler No. 2	0.05	0.21	0.05	0.21	0.04	0.15	0.004	0.02	0.64	2.79	0.54	2.35	
Cyclone	0.13	0.57	0.07	0.29									
Drum Dryer 1	1.95	8.54	1.95	8.54			0.01	0.05					
Drum Dryer 2	1.95	8.54	1.95	8.54			0.01	0.05					
Drum Dryer 3	1.95	8.54	1.95	8.54			0.01	0.05					
Drum Dryer 4	1.95	8.54	1.95	8.54			0.01	0.05					
Drum Dryer 5	1.95	8.54	1.95	8.54			0.01	0.05					
Drum Dryer 6	1.95	8.54	1.95	8.54			0.01	0.05					
Drum Dryer 7	1.95	8.54	1.95	8.54			0.01	0.05					
Drum Dryer 8	1.95	8.54	1.95	8.54			0.01	0.05					
Drum Dryer 9	1.95	8.54	1.95	8.54			0.01	0.05					
Drum Dryer 10	1.95	8.54	1.95	8.54			0.01	0.05					
Drum Dryer 11	1.95	8.54	1.95	8.54			0.01	0.05					
Drum Dryer 12	1.95	8.54	1.95	8.54			0.01	0.05					
National Dryer							0.01	0.05					
Process Emissions	1.71	7.49	1.71	7.49									
Fluidized Bed Dryer	3.53	15.48	3.53	15.48	0.02	0.11	0.081	0.35	0.67	2.94	0.38	1.66	
Flake Packaging													
Bulk Line	0.120	0.53	0.120	0.53									
Flake Packaging Line	0.080	0.35	0.080	0.35									
Flake Packaging													
Tort Line	0.080	0.35	0.080	0.35									
Flake Packaging													
Drum Negative Air													
Baghouse	0.180	0.79	0.180	0.79									
National Dryer A1	0.03	0.12	0.03	0.12	0.02	0.09	0.06	0.26	0.55	2.39	0.30	1.32	
National Dryer A2	0.03	0.12	0.03	0.12	0.02	0.09	0.06	0.26	0.55	2.39	0.30	1.32	
National Dryer B	0.03	0.12	0.03	0.12	0.02	0.09	0.06	0.26	0.55	2.39	0.30	1.32	
National Dryer C	0.03	0.12	0.03	0.12	0.02	0.09	0.06	0.26	0.55	2.39	0.30	1.32	
Propane Heaters	0.03	0.12	0.03	0.12	0.02	0.09	0.06	0.26	0.55	2.39	0.30	1.32	
Tanks					0.0012		0.06	0.26	0.68	3.00	0.30	1.32	
<b>TOTAL</b>	<b>33.92</b>	<b>148.57</b>	<b>33.86</b>	<b>148.29</b>	<b>1.49</b>	<b>6.53</b>	<b>23.47</b>	<b>102.82</b>	<b>53.11</b>	<b>232.60</b>	<b>7.63</b>	<b>33.42</b>	

Note: National Dryer PM/PM<sub>10</sub> emissions shown are just from propane combustion. These numbers should include an additional 0.43 lb/hr process emissions.  
(total 0.46 lb/hr, and total 2.02 T/yr)

## TOXIC AIR POLLUTANT EMISSION INVENTORY

**TABLE 1. NON-CARCINOGENS**

Pollutant	Max. Hourly Emissions (lb/hr)	Screening	Modeling? (Y/N)	Emissions (tons/yr)
		Level (lb/hr)		
Antimony	5.47E-03	3.3E-02	N	2.39E-02
Barium	2.80E-03	3.3E-02	N	1.22E-02
Chromium	9.20E-04	3.3E-02	N	3.99E-03
Cobalt	6.27E-03	3.3E-03	Y	2.75E-02
Copper	1.86E-03	6.7E-02	N	8.11E-03
Ethylbenzene	6.62E-05	2.9E+01	N	2.90E-04
Fluoride	3.88E-02	1.67E-01	N	1.70E-01
Hexane	5.20E-02	1.2E+01	N	2.28E-01
Manganese	3.13E-03	3.33E-01	N	1.37E-02
Mercury	2.96E-04	3.E-03	N	1.29E-03
Molybdenum	8.51E-04	6.67E-01	N	3.70E-03
Naphthalene	1.19E-03	3.33E+00	N	5.21E-03
Pentane	7.51E-02	1.18E+02	N	3.29E-01
Phosphorous	9.85E-03	7.E-03	Y	4.31E-02
Selenium	1.44E-03	1.3E-02	N	6.31E-03
1,1,1-Trichloroethane	2.67E-04	1.3E+02	N	1.08E-03
Toluene	6.53E-03	2.5E+01	N	2.86E-02
o-Xylene	1.28E-04	2.9E+01	N	4.97E-04
Vanadium	3.33E-02	3.0E-03	Y	1.45E-01
Zinc	3.09E-02	6.67E-01	N	1.36E-01

**TABLE 2. CARCINOGENS**

Pollutant	Max. Hourly Emissions (lb/hr)	Screening	Modeling? (Y/N)	Emissions (tons/yr)
		Level (lb/hr)		
Arsenic	1.38E-03	1.5E-06	Y	6.04E-03
Benzene	2.83E-04	8.0E-04	N	1.18E-03
Beryllium	2.88E-04	2.8E-05	Y	1.26E-03
Cadmium	3.20E-04	3.7E-06	Y	1.37E-03
Chromium VI	2.58E-04	5.6E-07	Y	1.13E-03
Formaldehyde	3.65E-02	5.1E-04	Y	1.58E-01
Nickel	6.24E-05	2.7E-05	Y	2.66E-04
Benzo(a)pyrene	3.47E-08	2.0E-06	N	1.52E-07
Benz(a)anthracene	4.23E-06	NA	NA	1.85E-05
Benzo(b,k)fluoranthene	1.59E-06	NA	NA	6.93E-06
Chrysene	2.53E-06	NA	NA	1.10E-05
Dibenzo(a,h)anthracene	1.79E-06	NA	NA	7.79E-06
Indeno(1,2,3-cd)pyrene	2.26E-06	NA	NA	9.88E-06
Total PAHs	1.22E-05	2.0E-06	Y	5.34E-05

Source: Supplemental application materials received by DEQ on July 13, 2006.

HAPs Inventory	
Pollutant	Emissions (tons/yr)
Arsenic	6.04E-03
Benzene	1.18E-03
Beryllium	1.26E-03
Cadmium	1.37E-03
Ethylbenzene	2.90E-04
Formaldehyde	1.58E-01
Chromium	1.13E-03
Lead	1.18E-04
Mercury	1.29E-03
1,1,1 - Trichlorethane (Methyl Chloroform)	1.08E-03
Naphthalene	5.21E-03
Nickel	2.66E-04
Xylene	4.97E-04
Selenium	6.31E-03
Toluene	2.86E-02
Phosphorus	4.31E-02
POM	1.98E-06
Dichlorobenzene	2.70E-05
Hexane	4.05E-02
<b>Total</b>	<b>2.96E-01</b>

Note: Emission Factors for lead, POM, dichlorobenzene and hexane are as follows (i.e., for those HAPs not listed above):

Lead	1.20E-07	lb/gal
	5.00E-04	lb/MMscf
POM	8.82E-05	lb/MMscf
Dichlorobenzene	1.20E-03	lb/MMscf
Hexane	1.8	lb/MMscf

Source: Supplemental application materials received by DEQ on July 13, 2006.

**Appendix C**

**Modeling Review**

**T2-060510**

## MEMORANDUM

**DATE:** November 9, 2006

**TO:** Cheryl Robinson, Air Quality Permitting Engineer, Air Program

**FROM:** Kevin Schilling, Modeling Coordinator – Stationary Sources, Air Program

**PROJECT NUMBER:** T2-060510

**SUBJECT:** Modeling Review for the RDO Processing LLC. Tier II Operating Permit Application for their facility near Dubois, Idaho.

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### **1.0 Summary**

RDO Processing, LLC (RDO) submitted a Tier II operating permit application for their dehydrated potato products facility located near Dubois, Idaho. The application requested allowance to operate their main boiler (Boiler No. 1) on high sulfur residual fuel or propane. Air quality analyses involving atmospheric dispersion modeling of emissions associated with the facility were submitted in support of a permit application to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.403.02). JBR Environmental Consultants, Inc. (JBR), RDO's consultant, conducted the ambient air quality analyses. Corrections to the modeling analyses were received by DEQ on July 13, 2006 with supplemental information received on August 22, 2006.

A technical review of the submitted air quality analyses was conducted by DEQ. The submitted modeling analyses in combination with DEQ's staff analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

<b>Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES</b>	
<b>Criteria/Assumption/Result</b>	<b>Explanation/Consideration</b>
Modeled design concentrations, when combined with a reasonably conservative background concentration, are well below the PM <sub>10</sub> NAAQS.	Unique permit limits or provisions are not necessary to assure compliance with applicable air quality standards.

### **2.0 Background Information**

#### ***2.1 Applicable Air Quality Impact Limits and Modeling Requirements***

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

##### ***2.1.1 Area Classification***

The RDO facility is located approximately 34 miles north of Idaho Falls on Interstate 15 near Dubois, Idaho. The facility is located within Clark County, designated as an attainment or unclassifiable area for sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), lead (Pb), and ozone (O<sub>3</sub>), and

particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM<sub>10</sub>). There are no Class I areas within 10 kilometers of the facility.

### 2.1.2 Significant and Full Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources at the facility exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.90, then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.403.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	Averaging Period	Significant Contribution Levels <sup>a</sup> (µg/m <sup>3</sup> ) <sup>b</sup>	Regulatory Limit <sup>c</sup> (µg/m <sup>3</sup> )	Modeled Value Used <sup>d</sup>
PM <sub>10</sub> <sup>e</sup>	Annual	1.0	50 <sup>f</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
	24-hour	5.0	150 <sup>h</sup>	Maximum 6 <sup>th</sup> highest <sup>i</sup>
Carbon monoxide (CO)	8-hour	500	10,000 <sup>j</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
	1-hour	2,000	40,000 <sup>j</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
Sulfur Dioxide (SO <sub>2</sub> )	Annual	1.0	80 <sup>f</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
	24-hour	5	365 <sup>j</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
	3-hour	25	1,300 <sup>j</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	1.0	100 <sup>f</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
Lead (Pb)	Quarterly	NA	1.5 <sup>h</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
<sup>a</sup> IDAPA 58.01.01.006.90 <sup>b</sup> Micrograms per cubic meter <sup>c</sup> IDAPA 58.01.01.577 for criteria pollutants <sup>d</sup> The maximum 1 <sup>st</sup> highest modeled value is always used for significant impact analysis <sup>e</sup> Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers <sup>f</sup> Never expected to be exceeded in any calendar year <sup>g</sup> Concentration at any modeled receptor <sup>h</sup> Never expected to be exceeded more than once in any calendar year <sup>i</sup> Concentration at any modeled receptor when using five years of meteorological data <sup>j</sup> Not to be exceeded more than once per year				

### 2.1.3 Toxic Air Pollutant Analyses

Toxic Air Pollutant (TAP) requirements for PTCs are specified in IDAPA 58.01.01.210. If the emissions increase associated with a new source or modification exceeds screening emission levels (ELs) of IDAPA 58.01.01.585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of IDAPA 58.01.01.585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of IDAPA 58.01.01.586, then compliance with TAP requirements has been demonstrated.

## 2.2 Background Concentrations

Background concentrations were revised for all areas of Idaho by DEQ in March 2003<sup>1</sup>. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Background concentrations used in

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

these analyses are listed in Table 3. Default concentrations for rural/agricultural areas were used for background concentrations.

Table 3. BACKGROUND CONCENTRATIONS		
Pollutant	Averaging Period	Background Concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup>
PM <sub>10</sub> <sup>b</sup>	24-hour	73
	annual	26
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	34
	24-hour	26
	annual	8
Carbon Monoxide (CO)	1-hour	3,600
	8-hour	2,300
Nitrogen Dioxide (NO <sub>2</sub> )	annual	17

<sup>a</sup>. Micrograms per cubic meter

<sup>b</sup>. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

### 3.0 Modeling Impact Assessment

#### 3.1 Modeling Methodology

Table 4 provides a summary of the modeling parameters used by JBR in the submitted analyses.

Table 4. MODELING PARAMETERS		
Parameter	Description/Values	Documentation/Additional Description
Model	ISC3-PRIME	
Meteorological data	Pocatello surface data Boise upper air data	1987 - 1991
Terrain	Considered	Elevation data from digital elevation model (DEM) files
Building downwash	PRIME algorithm	Building dimensions obtained from modeling files submitted
Receptor grid	Grid 1	25-meter spacing along boundary
	Grid 2	100-meter spacing out to 300 m
	Grid 3	250-meter spacing out to about 1,500 m
	Grid 4	500-meter spacing out to about 6,000 m
Facility location (UTM) <sup>a</sup>	Easting	402 kilometers
	Northing	4882 kilometers

<sup>a</sup> Universal Transverse Mercator

##### 3.1.1 Modeling protocol

A dispersion modeling protocol was not submitted to DEQ prior to submitting the application. JBR did, however, discuss appropriate data and methods with DEQ prior to submittal.

##### 3.1.2 Model Selection

ISC3-PRIME was used by JBR to conduct the ambient air analyses. ISC3-PRIME uses the PRIME downwash algorithm, which is superior to the existing downwash algorithms within ISCST3 and is capable of estimating concentrations within building recirculation cavities. Concentrations within building recirculation cavities is not a concern for this facility because the boundary to ambient air is very distant from the emissions sources and facility structures.

##### 3.1.3 Meteorological Data

Surface meteorological data collected at the Pocatello airport, combined with upper air data from Boise, were used with the meteorological data preprocessor PCRAMMET to generate a meteorological input file.

PCRAMMET, the meteorological data preprocessor for ISCST-3, occasionally generates unrealistically low mixing heights as a result of interpolation algorithms used with the twice daily measured mixing heights. The modeling analyses were conducted using meteorological data corrected for low mixing heights. All mixing height values below 50 meters were replaced with a value of 50 meters.

#### **3.1.4 Terrain Effects**

The modeling analyses submitted by JBR considered elevated terrain. Elevations of receptors, buildings, and emissions sources were calculated from United States Geological Survey (USGS) 7.5 minute Digital Elevation Model (DEM) files.

#### **3.1.5 Facility Layout**

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the modeling input to a facility plot plan submitted with the application and aerial photographs of the area.

#### **3.1.6 Building Downwash**

Plume downwash effects caused by structures proposed for the facility were accounted for in the modeling analyses. The Building Profile Input Program for PRIME (BPIP-PRIME) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters for ISC3.

#### **3.1.8 Ambient Air Boundary**

The ambient air boundary used for modeling conducted by JBR includes areas that are not owned by RDO. RDO entered into a Custom Farming Agreement with adjacent landowner BLF Land, LLC, as described in permit conditions and in the permit conditions review in the Statement of Basis. Because of this agreement, RDO has exclusive access control over all of the area within the ambient air boundary. DEQ assumed reasonable measures would be taken to ensure the general public are excluded from access to areas within the ambient air boundary.

#### **3.1.9 Receptor Network**

The receptor grids used by JBR met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. DEQ determined the receptor grid was adequate to reasonably resolve maximum modeled concentrations.

### **3.2 Emission Rates**

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application, the engineering technical memorandum, and the proposed permit. The following approach was used for DEQ verification modeling:

- All modeled emissions rates were equal to or greater than the facility's emissions calculated in the PTC application or the permitted allowable rate.
- More extensive review of modeling parameters selected was conducted when model results for specific sources approached applicable thresholds.



### 3.2.1 Criteria Pollutant Emissions Rates

Table 5 lists emissions rates for sources included in the short-term and long-term dispersion modeling analyses. Emissions from the drum dryers were modeled as the maximum emissions from all drum dryers combined, then evenly distributed among all the dryers. DEQ will not impose unit-specific operational limits for each of the dryers in the permit; therefore, a specific dryer could emit at quantities above the emissions rate modeled for that unit, with other units emitting at lower quantities during the given period. For near-field receptors, this modeling approach is not conservative. However, given the long distance from the sources to the ambient air boundary, this approach adequately assesses potential impacts to ambient air (see Section 3.4).

Table 5. MODELED EMISSIONS RATES FOR SHORT-TERM AND LONG-TERM					
Model Id	Description	Modeled Emission Rates (lb/hr) <sup>a</sup>			
		PM <sub>10</sub> <sup>b</sup>	SO <sub>2</sub> <sup>c</sup>	CO <sup>d</sup>	NOx <sup>e</sup>
BOILER_1	Boiler No. 1	21.66 <sup>f</sup> 4.50 <sup>g</sup>	22.88	5.21	48.93
DRUM1	Drum Dryer 1	1.95	0.010	0.0	0.0
DRUM3	Drum Dryer 3	1.95	0.010	0.0	0.0
DRUM5	Drum Dryer 5	1.95	0.010	0.0	0.0
DRUM2	Drum Dryer 2	1.95	0.010	0.0	0.0
DRUM4	Drum Dryer 4	1.95	0.010	0.0	0.0
DRUM6	Drum Dryer 6	1.95	0.010	0.0	0.0
DRUM7	Drum Dryer 7	1.95	0.010	0.0	0.0
DRUM8	Drum Dryer 8	1.95	0.010	0.0	0.0
DRUM9	Drum Dryer 9	1.95	0.010	0.0	0.0
DRUM10	Drum Dryer 10	1.95	0.010	0.0	0.0
DRUM11	Drum Dryer 11	1.95	0.010	0.0	0.0
DRUM12	Drum Dryer 12	1.95	0.010	0.0	0.0
NAT_A1	National Dryer A1	0.46	0.08	0.3	0.55
NAT_A2	National Dryer A2	0.46	0.08	0.3	0.55
NAT_B	National Dryer B	0.46	0.08	0.3	0.55
NAT_C	National Dryer C	0.46	0.08	0.3	0.55
FP_BULK	Flake Packaging Bulk Line	0.12	0.0	0.0	0.0
FP	Flake Packaging Line	0.08	0.0	0.0	0.0
FP_TOR	Flake Packaging Torit Line	0.08	0.0	0.0	0.0
REC_1	Propane Heater 1	0.01	0.02	0.1	0.23
REC_2	Propane Heater 2	0.01	0.02	0.1	0.23
REC_3	Propane Heater 3	0.01	0.02	0.1	0.23
FBD_DYR	Fluidized Bed Dryer	3.53	0.09	0.38	0.67
FP_BH	Flake Packaging Drum Negative Air Baghouse	0.18	0.0	0.0	0.0
BOILER_2	Boiler No. 2	0.05	0.004	0.54	0.64
04CYCLON	Cyclone	0.07	0.0	0.0	0.0

<sup>a</sup>. Pounds per hour emissions rates

<sup>b</sup>. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

<sup>c</sup>. Sulfur dioxide

<sup>d</sup>. Carbon monoxide

<sup>e</sup>. Oxides of nitrogen

<sup>f</sup>. Maximum 24-hour emissions

<sup>g</sup>. Maximum annual emissions

### 3.2.2 TAP Emissions Rates

Emissions increases in TAPs were analyzed for all proposed modifications to emissions units at the RDO facility. Dispersion modeling was conducted for those TAPs with total increased emissions exceeding applicable screening Emissions Levels (ELs) of IDAPA 58.01.01.585 and 586. Table 6 lists applicable TAP emissions modeled to evaluate compliance with TAP increments. Emissions of all other TAPs were below applicable screening emissions levels (ELs) and modeling was not required.

Table 6. MODELED TAP EMISSIONS RATES										
Source	Source-Specific Emissions Rates <sup>a</sup> (lb/hr) <sup>b</sup>									
	Co	P	V	Ar	Be	Cd	Cr6+	Form.	Ni	POM
BOILER 1	6.27E-3	9.85E-3	3.31E-2	1.37E-3	2.88E-4	2.88E-4	2.58E-4	3.44E-2	1.74E-6	1.17E-5
BOILER 2	5.4E-7	0.0	1.5E-5	1.3E-6	7.7E-8	7.0E-6	0.0	4.8E-4	1.3E-5	1.1E-5
FBD_DYR	3.8E-7	0.0	1.0E-5	9.0E-7	5.4E-8	5.0E-6	0.0	3.4E-4	9.5E-6	5.1E-8
NAT_A1	3.0E-7	0.0	8.3E-6	7.2E-7	4.3E-8	4.0E-6	0.0	2.7E-4	7.6E-6	4.1E-8
NAT_A2	3.0E-7	0.0	8.3E-6	7.2E-7	4.3E-8	4.0E-6	0.0	2.7E-4	7.6E-6	4.1E-8
NAT_B	3.0E-7	0.0	8.3E-6	7.2E-7	4.3E-8	4.0E-6	0.0	2.7E-4	7.6E-6	4.1E-8
NAT_C	3.0E-7	0.0	8.3E-6	7.2E-7	4.3E-8	4.0E-6	0.0	2.7E-4	7.6E-6	4.1E-8
REC 1	3.0E-7	0.0	8.3E-6	7.2E-7	4.3E-8	4.0E-6	0.0	2.7E-4	7.6E-6	4.1E-8
REC 2	3.0E-7	0.0	8.3E-6	7.2E-7	4.3E-8	4.0E-6	0.0	2.7E-4	7.6E-6	4.1E-8
REC 3	3.0E-7	0.0	8.3E-6	7.2E-7	4.3E-8	4.0E-6	0.0	2.7E-4	7.6E-6	4.1E-8

<sup>a</sup> Values for TAPs are maximum hourly emissions rates. Modeled TAPs include cobalt, phosphorus, vanadium, arsenic, beryllium, cadmium, chromium 6+, formaldehyde, nickel, and polycyclic organic matter.

<sup>b</sup> Pounds per hour

### 3.3 Emission Release Parameters

Table 7 provides emissions release parameters, including stack location, stack height, stack diameter, exhaust temperature, and exhaust velocity.

Table 7. EMISSIONS RELEASE PARAMETERS					
Release Point /Location	Source Type	Stack Height (m) <sup>a</sup>	Modeled Diameter (m)	Stack Gas Temp. (K) <sup>b</sup>	Stack Gas Flow Velocity (m/sec) <sup>c</sup>
BOILER 1	Point	13.7	2.0	324	6.36
DRUM1	Point	13.9	1.1	325	0.001 <sup>d</sup>
DRUM3	Point	13.9	1.1	325	0.001 <sup>d</sup>
DRUM5	Point	13.9	1.1	325	0.001 <sup>d</sup>
DRUM2	Point	13.9	1.1	325	0.001 <sup>d</sup>
DRUM4	Point	13.9	1.1	325	0.001 <sup>d</sup>
DRUM6	Point	13.9	1.1	325	0.001 <sup>d</sup>
DRUM7	Point	13.9	1.1	325	0.001 <sup>d</sup>
DRUM8	Point	13.9	1.1	325	0.001 <sup>d</sup>
DRUM9	Point	13.9	1.1	325	0.001 <sup>d</sup>
DRUM10	Point	13.9	1.1	325	0.001 <sup>d</sup>
DRUM11	Point	13.9	1.1	325	0.001 <sup>d</sup>
DRUM12	Point	13.9	1.1	325	0.001 <sup>d</sup>
NAT_A1	Point	14.0	0.87	339	6.88
NAT_A2	Point	14.0	0.87	353	6.88
NAT_B	Point	14.0	0.87	348	6.88
NAT_C	Point	14.0	0.87	338	6.88
FP_BULK	Point	11.8	0.20	293	17.59
FP	Point	12.1	1.2	293	5.67
FP_TOR	Point	10.3	0.08	293	0.001 <sup>d</sup>
REC 1	Point	10.8	0.12	305	0.001 <sup>d</sup>
REC 2	Point	10.5	0.12	305	0.001 <sup>d</sup>
REC 3	Point	10.8	0.12	305	0.001 <sup>d</sup>
FBD_DYR	Point	12.0	0.001 <sup>d</sup>	316	0.001 <sup>d</sup>
FP_BH	Point	11.4	0.47	293	33.01
BOILER 2	Point	12.6	0.51	452	6.77
04CYCLON	Point	13.4	0.001 <sup>d</sup>	293	0.001 <sup>d</sup>

<sup>a</sup> Meters

<sup>b</sup> Kelvin

<sup>c</sup> Meters per second

<sup>d</sup> Set to account for a horizontal or capped release, as specified by the Idaho Air Quality Modeling Guideline

### 3.4 Results for Significant and Full Impact Analyses

Table 8 summarizes the modeling results of the significant and full impact analyses. Maximum CO impacts were below SCLs and a full impact analysis was not required.

As explained in Section 3.2.1, the dryers were modeled by evenly distributing maximum emissions among all dryer stacks. Although this method is not conservative, DEQ modeling staff are confident the approach demonstrates compliance because of the following:

- All drum dryer stacks have identical release parameters (stack height, flow, temperature).
- The closest distance from the emissions sources to the ambient air boundary is over 1,100 meters. At this distance, the exact configuration of emissions from these closely spaced points will have an inconsequential affect on modeled concentrations.
- The PM<sub>10</sub> impacts, when combined with background concentrations are only 75 percent of the standard. With a background value of 73  $\mu\text{g}/\text{m}^3$ , the modeled impact from the facility would have to nearly double to exceed the standard.

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Maximum Modeled Concentration (<math>\mu\text{g}/\text{m}^3</math>)<sup>a</sup></b>	<b>Background Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Total Ambient Impact (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>NAAQS<sup>b</sup> (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Percent of NAAQS</b>
PM <sub>10</sub> <sup>c</sup>	24-hour	38.7d	73	111.7	150	75
	Annual	2.9e	26	28.9	50	58
SO <sub>2</sub>	3-hour	64.2f	34	98.2	1,300	8
	24-hour	12.5f	26	38.5	365	11
	Annual	2.53	8	10.1	80	13
CO	1-hour	66e	NA - impact below SCLs			
	8-hour	15e	NA - impact below SCLs			
NO <sub>2</sub>	Annual	4.88e	17	21.88	100	22

<sup>a</sup> Micrograms per cubic meter

<sup>b</sup> National ambient air quality standards

<sup>c</sup> Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

<sup>d</sup> Maximum 6<sup>th</sup> high modeled concentration using 5 years of meteorological data

<sup>e</sup> Maximum modeled concentration

<sup>f</sup> Maximum 2<sup>nd</sup> high modeled concentration obtained by modeling each of 5 years of meteorological data separately

<sup>g</sup> Impacts are below SCLs, therefore a full impact analysis was not required

### 3.5 Results for TAPs Analyses

Compliance with TAP increments were demonstrated by modeling uncontrolled TAP emissions increases (those TAPs with emissions exceeding the ELs) resulting from proposed modifications to the facility or allowed operations at the facility.

Table 9 summarizes the ambient TAP analyses. The submitted application incorrectly labeled POM as total PAHs, and used the AACC for total PAHs to demonstrate compliance with POM emissions. Idaho TAP increments in IDAPA 58.01.01.586 distinguish between POM and total PAHs. Table 9 includes corrections made to the compliance demonstration, which involved using the correct AACC for POM.

Table 9. RESULTS OF TAP ANALYSES				
TAP	Averaging Period	Maximum Modeled Concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup>	AAC/AACC <sup>b</sup> ( $\mu\text{g}/\text{m}^3$ )	Percent of AAC/AACC
Cobalt	24-hour	0.00399	2.5	0.16
Phosphorus	24-hour	0.00626	5	0.13
Vanadium	24-hour	0.0211	2.5	0.8
Arsenic	Annual	1.30E-4	2.3E-4	56
Beryllium	Annual	<1.0E-5	4.2E-3	<0.2
Cadmium	Annual	4.00E-5	5.6E-4	7
Chromium 6+	Annual	2.00E-5	8.3E-5	24
Formaldehyde	Annual	3.32E-3	7.7E-2	4
Nickel	Annual	1.00E-5	4.2E-3	0.2
POM	Annual	<1.0E-5	3.0E-4	<3

<sup>a</sup>. Micrograms per cubic meter

<sup>b</sup>. Acceptable Ambient Concentration or Acceptable Ambient Concentration for a Carcinogen

## 4.0 Conclusions

The ambient air impact analysis submitted, consisting of dispersion modeling and an evaluation of applicable background concentrations, demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application and DEQ analyses, will not cause or significantly contribute to a violation of any air quality standard.